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| APPLICATION NO.                                                                                                                   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO.       |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|-------------------------|------------------------|
| 10/800,750                                                                                                                        | 03/16/2004  | Miwa Shigematsu      | 19546.0059              | 1172                   |
| 23517 7590 10/17/2007<br>BINGHAM MCCUTCHEN LLP<br>2020 K Street, N.W.<br>Intellectual Property Department<br>WASHINGTON, DC 20006 |             |                      | EXAMINER<br>LIU, BEN H  |                        |
|                                                                                                                                   |             |                      | ART UNIT<br>2616        | PAPER NUMBER           |
|                                                                                                                                   |             |                      | MAIL DATE<br>10/17/2007 | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                          |  |
|------------------------------|--------------------------------------|------------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/800,750 | <b>Applicant(s)</b><br>SHIGEMATSU ET AL. |  |
|                              | <b>Examiner</b><br>Ben H. Liu        | <b>Art Unit</b><br>2616                  |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                         |                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                             | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>16 March, 2004</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 10, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "said combined frame" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "said combined packet" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 is generally narrative and indefinite, failing to conform with current U.S. practice.

Claim 14 recites the limitation "said combined packet" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 10, 11-14, and 20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Agarwal (U.S. Patent Number 6,931,009).

For claim 1, Agarwal discloses a method of frame forwarding in a network, comprising the steps of receiving a frame from an input port, the frame containing a packet (see column 3 lines 45-51); determining an output port coupled with a destination node of the packet via a data path; building a forwarding frame containing the packet (see column 3 lines 40-45); storing the forwarding frame in an output queue corresponding to the output port (see column 12 lines 40-42; combining a plurality of forwarding frames stored in the output queue into a combined frame and transmitting the combined frame to the output port (see column 3 lines 53-59). In figure 2, Agarwal shows a frame containing either multiple cells or packets (see entity 240 and column 3 lines 6-8).

For claim 2, Agarwal discloses a method of frame forwarding in a network, further comprising the steps of preparing a routing table, each entry of the routing table containing a destination address value indicating a destination node of the packet, a port ID value indicating the output port, and a forwarding address value; extracting a destination address value from the packet contained in the frame; looking up the destination address value in the routing table; determining the port ID value and the forwarding address value corresponding to the destination address value; building a forwarding frame with a header field and a data field, the header field containing the forwarding address value as a destination address, the data field containing the packet; and storing the forwarding frame into the output queue corresponding to the output port (see column 3 lines 40-51).

For claim 3, Agarwal discloses a method of frame forwarding in a network, further comprising the steps of extracting a plurality of forwarding frames from the output queue, combining each packet contained in each of the forwarding frames into one combined packet; building a combined frame containing the combined packet as a data field, the combined frame having a header including a predetermined ID value, the predetermined ID value indicating that the combined frame contains the combined packet; and transmitting the combined frame to the output port (see column 3 lines 53-59).

For claim 4, Agarwal discloses a method of frame forwarding in a network, further comprising the steps of receiving the combined frame from the input port; extracting the combined packet from the combined frame; decomposing the combined packet to original packets; determining the output port coupled with destination node of each of the original packets via the data path; building the forwarding frame containing each of the original packets; and storing the forwarding frame in the output queue corresponding to the output port (see column 4 lines 18-25).

For claim 5, Agarwal discloses a method of frame forwarding in a network, further comprising the steps of preparing a packet counter in the output queue, the packet counter indicating a number of packets to be combined wherein a size of the combined packet does not exceed the maximum data field size defined in Ethernet; combining a plurality of packets contained in the plurality of forwarding frames stored in the output queue into the combined packet, wherein the plurality of packets are combined in queuing order and the number of packets combined is equal to the packet counter (see column 15 lines 15-24).

For claim 6, Agarwal discloses a method of frame forwarding in a network wherein the combined packet has a following data allocation: (1) the number of packets to be combined, (2) a sequence of size values of original packets, and (3) a sequence of original packets, wherein the sequence of size values of the original packets are allocated in the same order as the sequence of the original packets (see column 15 lines 15-24).

For claim 10, Agarwal discloses a method of frame forwarding in a network, comprising the steps of forming a plurality of output queues which are including a plurality of frames to be sent from same port, respectively; combining the plurality of frames in one of the plurality of output queues into a combined frame; and transmitting the combined frame from a corresponding port (see column 3 lines 40-59). In figure 2, Agarwal shows a frame containing multiple cells or packets (see entity 240 and column 3 lines 6-8).

For claim 11, Agarwal discloses a switch for frame forwarding in a network, comprising a frame receiver for receiving a frame from an input port, the frame containing a packet; a routing means for determining an output port coupled with a destination node of the packet via a data path; a frame builder for building a forwarding frame containing the packet (see column 3 lines 40-51); an output queue for storing the forwarding frame, the output queue corresponding to the output port; a frame composer for combining a plurality of forwarding frames stored in the output queue into a combined frame; and a frame transmitter for transmitting the combined frame to the output port (see column 3 lines 53-59). In figure 2, Agarwal shows a frame containing multiple cells or packets (see entity 240 and column 3 lines 6-8).

For claim 12, Agarwal discloses a switch for frame forwarding in a network, further comprising a routing table for recording forwarding information entries, each of the forwarding

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information entries containing a destination address value indicating a destination node of the packet, a port ID value indicating the output port, and a forwarding address value indicating a frame forwarding node; and a routing control for determining the port ID value and the forwarding address by looking up the destination address value in the routing table (see column 3 lines 40-51).

For claim 13, Agarwal discloses a switch for frame forwarding in a network, wherein the frame composer extracts the forwarding frames from the output queue, combines each packet contained in each of the forwarding frames into a combined packet, and builds the combined frame containing the combined packet as a data field, the combined frame having a header including, a predetermined ID value, the predetermined ID value indicating that the combined frame contains the combined packet (see column 3 lines 40-59).

For claim 14, Agarwal discloses a switch for frame forwarding in a network, further comprising a frame decomposer for decomposing the combined packet contained in the frame received from the input port to original packets, the original packets being processed by the routing means (see column 4 lines 18-25).

For claim 15, Agarwal discloses a switch for frame forwarding in a network wherein the output queue has a packet counter indicating the number of packets to be combined, and a plurality of packets contained in the plurality of forwarding frames stored in the output queue are combined into the combined packet in queuing order wherein the number of packets combined is equal to the packet counter, and a size of the combined packet does not exceed the maximum data field size defined in Ethernet (see column 15 lines 15-24).

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For claim 16, Agarwal discloses a switch for frame forwarding in a network wherein the combined packet includes: (1) the number of packets to be combined, (2) a sequence of size values of original packets, and (3) a sequence of the original packets wherein the sequence of size values of the original packets are disposed in the same order as the sequence of the original packets (see column 15 lines 15-24).

For claim 20, Agarwal discloses a switch for frame forwarding in a network, comprising an output queue for storing a plurality of frames to be sent from a port; means for combining the plurality of frames in the output queue into a combined frame; and means for transmitting the combined frame from the port (see column 3 lines 40-59).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.



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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 7-8 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal (U.S. Patent Number 6,931,009) in view of Benveniste (U.S. Patent Application Number 2002/0163933).

For claims 7-8 and 17-18, Agarwal discloses all the subject matter of the claimed invention with the following exceptions:

A method of frame forwarding in a network further comprising the steps of preparing a timer monitor corresponding to the output queue, the timer monitor having a timer with a predetermined expiring time; activating the timer at a completion of frame transmission; suspending composition and transmission of forwarding frames stored in the output queue while the timer is active; executing composition and transmission of the forwarding frames at expiration of the predetermined expiring time as recited in claim 7.

A method of frame forwarding in a network further comprising the steps of setting the predetermined expiring time for the minimum time value of the inter-frame gap defined in Ethernet as recited in claim 8.

A switch for frame forwarding in a network further comprising a timer monitor for controlling composition and transmission of the forwarding frames stored in the output queue, the timer monitor having a timer with a predetermined expiring time, the timer being activated at a completion of frame transmission, the timer monitor suspending composition and transmission of the forwarding frames while the timer is active, the timer monitor executing composition and

transmission of the forwarding frames at expiration of the predetermined expiring time as recited in claim 17.

A switch for frame forwarding in a network wherein the predetermined expiring time is set for the minimum time value of the inter-frame gap defined in Ethernet as recited in claim 18.

Benveniste from the same or similar fields of endeavor discloses a QoS communications system that includes the use of polling frames to communicate with other nodes in the network (see paragraph 59 and 120). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the communications system with the polling frames as taught by Benveniste with the method for forwarding frames with combined packets as taught by Agarwal. The polling frame as taught by Benveniste can be implemented by configuring the frame switches as taught by Agarwal to support frame polling through software. The motivation for using communications system with the polling frames as taught by Benveniste with the method for forwarding frames with combined packets as taught by Agarwal is to allow nodes to seek permission to access a medium for the transmission of data.

7. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal (U.S. Patent Number 6,931,009) in view of Benveniste (U.S. Patent Application Number 2002/0163933).

For claims 9 and 19, Agarwal discloses all the subject matter of the claimed invention with the following exceptions:

A method of frame forwarding in a network further comprising the steps of transmitting to a forwarding node a query frame, the query frame including a function-query packet for

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querying whether the forwarding node is available for processing the combined frame; receiving a response frame from the forwarding node, the response frame including a check-response packet indicating that the forwarding node is available for processing the combined frame; and determining that the forwarding node is available for processing the combined frame as recited in claim 9.

A switch for frame forwarding in a network further comprising a function checker for determining whether a forwarding node is available for processing the combined frame, the function checker transmitting to the forwarding node a frame including a function-query packet for querying whether the forwarding node is available for processing the combined frame, the function checker receiving from the forwarding node a response frame including a check-response packet indicating that the forwarding node is available for processing the combined frame as recited in claim 19.

Benveniste from the same or similar fields of endeavor discloses a QoS communications system that includes a transmission timer (see paragraph 132). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the communications system with the transmission timer as taught by Benveniste with the method for forwarding frames with combined packets as taught by Agarwal. The transmission timer as taught by Benveniste can be implemented by configuring the frame switches as taught by Agarwal to support transmission timers through software. The motivation for using communications system with the transmission timer as taught by Benveniste with the method for forwarding frames with combined packets as taught by Agarwal is to allow scheduling transmissions for different types of packets.

***Conclusion***


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (see form 892).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben H. Liu whose telephone number is (571) 270-3118. The examiner can normally be reached on 9:00AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on (571) 272-6703. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BL

  
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